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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/824,507

04/14/2004

James M. Chwalek

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09/18/2006

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EXAMINER

MARTIN, LAURA E

ART UNIT

PAPER NUMBER

2853

DATE MAILED: 09/18/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/824,507

Applicant(s)

CHWALEK ET AL.

Examiner

Laura E. Martin

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 17 July 2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-26 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-26 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Hawkins (US 6572222).

Hawkins discloses a fluid chamber having an orifice (figure 1C, element 18); a fluid drop forming mechanism (figure 1, element 30) associated with the fluid chamber and being operable to apply to fluid present in the fluid chamber energy efficient to cause a fluid drop to be ejected from the orifice (column 5, lines 30-61); and a fluid drop steering device associated with the fluid chamber and being operable to optionally apply energy insufficient to cause drop formation to fluid present in the fluid chamber prior to the fluid being ejected from the orifice, the fluid drop steering device being distinct from the fluid drop forming mechanism (figure 1C, element 32).

### ***Claim Rejections - 35 USC § 103***

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The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 6-8, 13-15, 17, 21, 22, 24, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hawkins (US 6572222) in view of Anagnostopoulos et al. (US 6213595).

**Hawkins discloses the following claim limitations:** The printhead of claim 1.

**Hawkins does not disclose the following claim limitations:**

As per claim 6: a printhead wherein the fluid drop steering device is a heater operatively associated with the fluid chamber.

As per claim 7: a printhead the fluid chamber having a side wall, wherein the heater is formed as a portion of the side wall.

As per claim 8: a printhead wherein the heater is in electrical communication with electrical contacts located outside of the fluid chamber.

As per claim 13: a printhead wherein the heater is located outside the fluid chamber.

As per claim 14: a printhead the fluid chamber having a side wall, wherein the heater is located adjacent to the side wall.

As per claim 15: a printhead the printhead further comprising: a fluid reservoir in fluid communication with the fluid chamber, wherein the fluid drop steering device is a heater operatively associated with the fluid reservoir.

As per claim 17: a printhead wherein the fluid drop forming mechanism comprises a heater operatively associated with the fluid chamber.

As per claim 21: a printhead wherein the fluid drop forming mechanism is a continuous drop forming mechanism.

As per claim 22: a printhead wherein the fluid drop steering device comprises a plurality of steering devices positioned about the orifice of the fluid chamber.

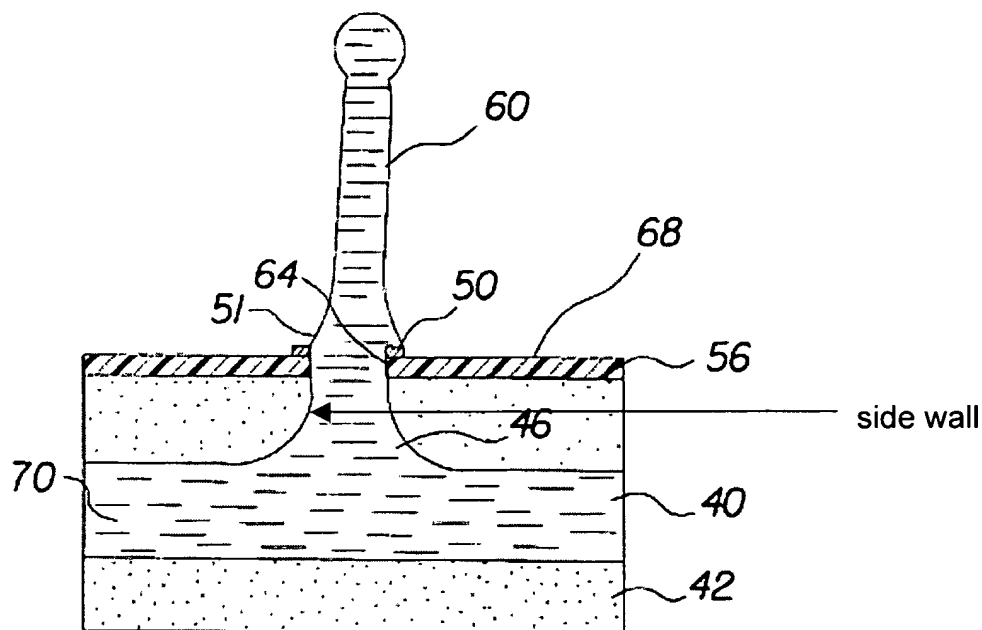
As per claim 24: a printhead the fluid chamber having a side wall, wherein the fluid drop steering device comprises a portion of the side wall of the fluid chamber.

As per claim 26: a printhead wherein the fluid drop steering device is located removed from the fluid chamber.

**Anagnostopoulos et al. discloses the following claim limitations:**

As per claim 6, Anagnostopoulos et al. teaches a printhead, wherein the fluid drop steering device is a heater (figure 2A, element 50) operatively associated with the fluid chamber (figure 2A, element 46).

As per claim 7, Anagnostopoulos et al. teaches a printhead, the fluid chamber having a side wall (shown below), wherein the heater is formed as a portion of the side wall (figure 2A, element 50).



As per claim 8, Anagnostopoulos et al. teaches a printhead, wherein the heater is in electrical communication with electrical contacts located outside of the fluid chamber (figure 1, element 14 and column 3, lines 40-48).

As per claim 13, Anagnostopoulos et al. teaches a printhead, wherein the heater is located outside the fluid chamber (figure 2A, element 50).

As per claim 14, Anagnostopoulos et al. teaches a printhead, the fluid chamber having a side wall (figure 2A, shown above), wherein the heater is located adjacent to the side wall (figure 2A, element 50).

As per claim 15, Anagnostopoulos et al. teaches a printhead, the printhead further comprising: a fluid reservoir in fluid communication with the fluid chamber,

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wherein the fluid drop steering device is a heater operatively associated with the fluid reservoir (column 6, lines 19-31).

As per claim 17, Anagnostopoulos et al. teaches a printhead, wherein the fluid drop forming mechanism comprises a heater operatively associated with the fluid chamber (figure 2A, element 50).

As per claim 21, Anagnostopoulos et al. teaches a printhead, wherein the fluid drop forming mechanism is a continuous drop forming mechanism (column 2, lines 44-47).

As per claim 22, Anagnostopoulos et al. teaches a printhead, wherein the fluid drop steering device comprises a plurality of steering devices positioned about the orifice of the fluid chamber (figure 2A, element 50 and column 6, lines 19-31).

As per claim 24, Anagnostopoulos et al. teaches a printhead, the fluid chamber having a side wall, wherein the fluid drop steering device comprises a portion of the side wall of the fluid chamber (figure 2A, shown above).

As per claim 26, Anagnostopoulos et al. teaches a printhead, wherein the fluid drop steering device is located removed from the fluid chamber (figure 2A, element 50).

Claims 2-4, 19, 23, and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hawkins (US 6572222) and Anagnostopoulos et al. (US 6213595), and further in view of Sharma et al. (US 2001/0045973).

Hawkins as modified discloses a printhead as recited in claim 1.

**Hawkins and Anagnostopoulos et al. do not disclose the following limitations:**

As per claim 2, a printhead, wherein the fluid drop steering device is a mechanical actuator located in the fluid chamber.

As per claim 3, a printhead, wherein the mechanical actuator is a paddle.

As per claim 4, a printhead, the fluid chamber having a side wall, wherein the paddle is located adjacent to the side wall (figure 3, element 11) of the fluid chamber.

As per claim 19, a printhead, wherein the fluid drop forming mechanism comprises an actuator movable between a plurality of positions.

As per claim 23, a printhead, wherein the fluid drop steering device comprises a mechanical actuator movable between a plurality of positions and operatively associated with the fluid chamber.

As per claim 25, a printhead, wherein the fluid drop steering device (figure 4A, element 28) is located within the fluid chamber.

As per claim 2, Sharma et al. teaches a printhead, wherein the fluid drop steering device is a mechanical actuator located in the fluid chamber (figure 3, element 28).

As per claim 3 Sharma et al. teaches a printhead, wherein the mechanical actuator is a paddle [0033].



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As per claim 4, Sharma et al. teaches a printhead, the fluid chamber having a side wall, wherein the paddle is located adjacent to the side wall (figure 3, element 11) of the fluid chamber (figure 3, element 28).

As per claim 19, Sharma et al. teaches a printhead, wherein the fluid drop forming mechanism comprises an actuator movable between a plurality of positions (figure 4A, element 28).

As per claim 23, Sharma et al. teaches a printhead, wherein the fluid drop steering device comprises a mechanical actuator movable between a plurality of positions and operatively associated with the fluid chamber (figure 4A, element 7).

As per claim 25, Sharma et al. teaches a printhead, wherein the fluid drop steering device (figure 4A, element 28) is located within the fluid chamber (figure 4A, element 7).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the printhead of Hawkins as modified with the disclosure of Sharma et al. in order to create an effective steering mechanism.

Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hawkins (US 6572222), Anagnostopoulos et al. (US 6213595) and Sharma et al. (US 2001/0045973) and further in view of Hawkins et al. (US 6517197).

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Hawkins, Anagnostopoulos et al. and Sharma et al. teach the printhead of claim 2; however, they do not disclose the mechanical actuator being a valve.

Hawkins et al. teaches a valve being the actuator (column 2, lines 17-27).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the printhead of Hawkins as modified with the disclosure of Hawkins et al. in order to create a higher quality printhead.

Claims 9-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hawkins (US 6572222) and Anagnostopoulos et al. (US 6213595), and further in view of Dante et al. (US 2002/0093547).

As per claim 9, Hawkins as modified teaches the printhead of claim 6.

As per claim 10, Anagnostopoulos et al. teaches the chamber having a side wall (shown above), wherein the heater is located adjacent to the side wall (figure 2A, element 50).

As per claim 11, Anagnostopoulos et al. teaches the heater coupled to the fluid drop forming mechanism (column 3, lines 35-47).

As per claim 9, Hawkins as modified does not teach a heater being located in the fluid chamber.

As per claim 12, Hawkins as modified does not teach an orifice being located in a nozzle plate, wherein the heater is located adjacent to the nozzle plate.

As per claim 9, Dante et al. does not teach a heater (figure 1, element 106) being located in the fluid chamber (figure 1, element 114).

As per claim 12, Dante et al. does not teach an orifice being located in a nozzle plate, wherein the heater is located adjacent to the nozzle plate (figure 1, element 108).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the printhead of Hawkins as modified with the disclosure of Dante et al. in order to create a higher quality printing apparatus in which the ink is located closer to the heater, thus being heated at a quicker rate.

Claims 16, 18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hawkins (US 6572222) and Anagnostopoulos et al. (US 6213595), and further in view Jeanmarie (US 6491362).

Hawkins as modified teaches a printhead.

As per claim 16, Hawkins as modified does not teach a printhead, wherein the fluid drop steering device is a plurality of electrodes operatively associated with the fluid chamber .

As per claim 18, Hawkins as modified does not teach a printhead, wherein the fluid drop forming mechanism comprises a piezoelectric actuator operatively associated with the fluid chamber.

As per claim 20, Hawkins as modified does not teach a printhead, wherein the fluid drop forming mechanism is a drop on demand drop forming mechanism.

As per claim 16, Jeanmarie teaches a printhead, wherein the fluid drop steering device is a plurality of electrodes operatively associated with the fluid chamber (column 2, lines 8-19).

As per claim 18, Jeanmarie teaches a printhead, wherein the fluid drop forming mechanism comprises a piezoelectric actuator operatively associated with the fluid chamber (column 1, lines 34-46).

As per claim 20, Jeanmarie teaches a printhead, wherein the fluid drop forming mechanism is a drop on demand drop forming mechanism (column 1, lines 34-38).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the printhead of Hawkins as modified with the disclosure of Jeanmarie in order to create a higher quality print apparatus.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-26 have been considered but are moot in view of the new ground(s) of rejection.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Laura E. Martin whose telephone number is (571) 272-2160. The examiner can normally be reached on Monday - Friday, 7:00 - 3:30.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen D. Meier can be reached on (571) 272-2149. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Laura E. Martin

 9/14/06  
**MANISH S. SHAH**  
**PRIMARY EXAMINER**